NOTES.

The following is a list of those to whom the Royal Society has this year awarded medals. The awards of the Royal medals have received the King's approval:—The Copley medal to Sir Ray Lankester, on the ground of the high scientific value of the researches in zoology carried out by him, and of the researches inspired and suggested by him and carried out by his pupils. A Royal medal to Prof. H. B. Dixon, F.R.S., for his researches in physical chemistry, especially in connection with explosions in gases. A Royal medal to Prof. E. H. Starling, F.R.S., for his contributions to the advancement of physiology. The Davy medal to Prof. R. Meldola, F.R.S., for his work in synthetic chemistry. The Hughes medal to Dr. Alexander Graham Bell, on the ground of his share in the invention of the telephone and more especially the construction of the telephone receiver. The Sylvester medal to Dr. J. W. L. Glaisher, F.R.S., for his mathematical researches.

Prof. J. N. Langley, F.R.S., professor of physiology in the University of Cambridge, has been elected a corresponding member of the Academy of Sciences at Munich.

The Mary Kingsley medal of the Liverpool School of Tropical Medicine was presented on November 14 to Prof. F. V. Theobald, Vice-Principal and zoologist of the South-Eastern Agricultural College, Wye.

We regret to see the announcement of the death on November 10, at sixty-four years of age, of Colonel St. George C. Gore, R.E., Surveyor-General of India in the years 1899–1904.

We notice with regret the death, at fifty-six years of age, of Mr. A. J. Wallis, fellow and bursar of Corpus Christi College, Cambridge. Mr. Wallis was bracketed fourth wrangler in the tripos of 1879, and was also bracketed equal with Prof. M. J. M. Hill, now of University College, London, for the Smith's prizes in that year.

The death is announced of Dr. R. L. Bowles, at seventy-nine years of age. Dr. Bowles was a fellow of the Royal Society of Medicine, and was for some time president of the south-eastern branch of the British Medical Association. He was the author of a number of papers, including the article "Stertor" in "Quain's Dictionary of Medicine," and articles on the treatment of certain diseases of the heart at Bad Nauheim, the influence of light on the skin, and other subjects.

The mounted head of an Indian rhinoceros (*Rhinoceros unicornis*), shot in the Nepalese Tarai by the King in 1911, and presented by his Majesty, has been placed on exhibition in the corridor leading to the upper mammal gallery, in the Natural History Museum, South Kensington. This trophy, which has been mounted by Messrs. Rowland Ward, Ltd., is in juxtaposition to the Nepalese tiger presented by the King some month ago, and faces the Hume bequest of Indian big-game heads.

The authorities of the Natural History Museum, South Kensington, have in preparation an exhibition of a representative series of specimens selected from the collections made by the Scott Antarctic Expedition. The specimens, chiefly marine invertebrates, have been selected by Mr. D. G. Lillie, a member of the scientific staff on board the *Terra Nova*, who is engaged at present in sorting out the collections preparatory to their being sent to specialists to be worked out and described in the monumental report on the scientific results of the expedition, the publication of which has been undertaken by the trustees of the British Museum. The specimens, which are being arranged for exhibition by Dr. W. G. Ridewood, form, of course, only a very small portion of the collections brought home by the *Terra Nova*, but they will serve to show the public some of the more striking and interesting species obtained in southern waters. Two cases in the central hall are being set apart for the purpose.

A severe earthquake is reported to have occurred at Abancay, in Peru, on November 7. According to the meagre accounts which have reached this country two hundred people were killed and many villages were destroyed. Abancay lies about 250 miles east-south-east of Lima, but, so far as known, it seems to have been free from disastrous earthquakes in the past. On November 13 another earthquake, the third since the beginning of October, occurred in the isthmus of Panama, but again without causing any damage to the canal structures.

The annual conversazione of the Selborne Society will be held on November 21 in the theatre and halls of the Civil Service Commission, Burlington Gardens; as usual, there will be a large display of microscopes, and in the hall devoted to general exhibits an effort will be made to show by means of skins and feathers how wild species of birds and mammals are being saved from extinction by rearing them in captivity, as in the case of the ostrich and the silver fox, by protecting them, and by using the products of truly domesticated species in their place.

At the anniversary meeting of the Mineralogical Society, held on November 11, the following officers and members of council were elected:—*President*, Dr. A. E. H. Tutton, F.R.S.; *Vice-Presidents*, Prof. H. L. Bowman and Dr. A. Hutchinson; *Treasurer*, Sir William P. Beale, Bart., K.C., M.P.; *General Secretary*, Dr. G. T. Prior, F.R.S.; *Foreign Secretary*, Prof. W. W. Watts, F.R.S.; *Editor of the Journal*, Mr. L. J. Spencer; *Members of Council*, Mr. W. Barlow, F.R.S., Mr. T. Crook, Sir Thomas H. Holland, K.C.I.E., F.R.S., Dr. G. F. H. Smith, Mr. F. H. Butler, Mr. J. P. De Castro, Mr. B. Kitto, Prof. A. Liversidge, F.R.S., Dr. J. J. H. Teall, F.R.S., Mr. F. N. A. Fleischmann, Mr. H. Hilton, and Mr. A. Russell.

Mr. Austen Chamberlain presided at a meeting at the London Chamber of Commerce on November 13 for the purpose of dissolving the subcommittee which had been formed for the purpose of raising funds for the London School of Tropical Medicine. The amount of the fund to date is 71,444*l.*, which, after deducting expenses, leaves a balance of 70,431*l*. available for the purposes of the school. Mr. Otto Beit and the Government of the Federated Malay States each contributed 5000*l*., and Sir William Bennet allocated the Wandsworth bequest of 10,000*l*. to the fund for purposes of research. After deducting the last-named, together with 15,000*l*. spent on new laboratories and hostel and an endowment for certain beds for tropical cases (to be named the "Chamberlain Ward"), there remain 39,000*l*. to form an endowment for the general purposes of the school.

THE death is announced of Dr. W. J. Ansorge, the well-known African explorer and natural history collector, at Loanda, Angola, on October 31. Dr. Ansorge was born in Bengal, in 1850, and educated at Pembroke College, Cambridge. His collections, which included mammals, birds, and fishes, were very extensive, and obtained from such widely sundered districts as Angola, Nigeria, Uganda, and British and German East Africa. A large proportion of the collection of birds is in Mr. Rothschild's museum at Tring, but there is also a considerable series in the British Museum, inclusive of 258 skins from Benguela and Uganda, purchased in 1895–6. At least one mammal—*Lophuromys ansorgei*—bears the name of the deceased collector, and in the first two volumes of the British Museum Catalogue of the Fresh-water Fishes of Africa there are eight species named in his honour. A few years ago he presented to the museum several skulls and horns of East African antelopes and rhinoceroses. Dr. Ansorge was the author of "Under the African Sun," published in 1899.

THE annual Huxley Memorial Lecture of the Royal Anthropological Institute was delivered on November 14 by Prof. W. J. Sollas, upon the subject of Paviland Cave. The Cave of Paviland, which opens on the face of a steep limestone cave about a mile east of Rhossili, on the coast of Gower (Wales), provided an almost ideal hunting lodge to Palæolithic man. The discovery by Buckland, in the kitchen midden which forms its floor, of a painted skeleton long known as the "Red Lady," rendered it famous. Recent investigation has shown that this skeleton is the remains of a man belonging to the tall Crô-Magnon race, which occupied the greater part of habitable Europe in the Aurignacian age (Upper Palæolithic). The bone of the animals, most of them extinct, found in the cave are in agreement with this conclusion. The associated implements are also Aurignacian. Paviland Cave is thus the most westerly outpost of the Crô-Magnon race, and at the same time the first Aurignacian station yet discovered in Britain.—At the conclusion of the lecture the president presented Prof. Sollas with the Huxley memorial medal for 1913.

A FEW months ago *The Scientific American* offered prizes for the three best essays on the ten greatest patentable inventions of the past twenty-five years. The results were announced in the issue of our contemporary for November 1. No two competitors selected the same set of inventions. In fact, only one invention, that of wireless telegraphy, was conceded unanimously to belong to the group of the ten greatest. The vote on aëroplanes was almost unanimous. But beyond that there was no unanimity. The conditions of the contest stated that greatness would be measured in terms of practical success and general usefulness to mankind; the competitors were limited to machines, devices, and discoveries commercially introduced in the last twenty-five years, and special emphasis was laid on the fact that the inventions must be patentable, although not necessarily patented. A dozen essays were afterwards picked out at random, and these were found to contain forty different subjects. The list of these subjects was published, and readers of *The Scientific American* were invited to vote upon it The result shows that the vote was not unanimous even on wireless telegraphy. The following twelve inventions secured the highest number of votes, the number printed after each representing a percentage of the votes given:—Wireless telegraphy, 97; aëroplane, 75; X-ray machine, 74; automobile, 66; motion pictures, 63; reinforced concrete, 37; phonograph, 37; incandescent electric lamp, 35; steam turbine, 34; electric car, 34; calculating machine, 33; internal-combustion engine, 33.

A CONFERENCE of members of the Museums Association and others interested in museum work was held at Warrington on October 30, on the invitation of the committee of the Municipal Museum. Representatives attended of the museums of Liverpool, Manchester, Hull, Bolton, Salford, Leicester, Stoke-on-Trent, and other towns. Mr. P. Entwistle (Liverpool Museum) raised the question how far it was allowable to go in the restoration of imperfect specimens, maintaining the view, with which the meeting generally agreed, that such restoration as was required to give a clear impression of the form of the object was desirable, provided that the extent of the restoration were obvious on close examination. Dr. Tattersall (Manchester Museum), in a paper on museums and local collections, with the outlines of a scheme for the compilation of a fauna of Lancashire, said that the first duty of a provincial museum was to collect and preserve specimens illustrating the natural history of the surrounding district, and proposed that an organisation should be formed to link up the existing museums in Lancashire with the various natural science societies, and specialists in various zoological groups. The museums would receive the specimens collected locally and forward them to appointed centres, where they would be named and recorded, and returned when dealt with to the same museums for permanent preservation. A committee was appointed, with Dr. Tattersall as convener, to take preliminary steps to carry out the scheme. Mr. Madeley (Warrington Museum) announced that it was proposed, provided a sufficient number of museums agreed to subscribe, to prepare and distribute a series of casts of, say twenty, typical British stone implements from the British Museum collections. The selection would be made by Sir Hercules Read, who had also kindly consented to prepare a description to accompany the casts.

PROF. A. KEITH, in the November issue of *Man*, describes two ancient crania found by the Rev. H. Mason in an old deposit at Wanganui, New Zealand. They belong to the Moriori race, now confined—a mere remnant—to the Chatham Islands. They inhabited New Zealand before the arrival of the Maori, and their crania differ in a remarkable degree from those of the latter race. The Moriori skulls are devoid of negroid characteristics, the stock to which the Maori are more closely allied. The Moriori are evidently related to some of the Polynesian and South American races; at least it is among these peoples that we find cranial forms which are comparable with them.

WE have received from the Land Agents' Society a copy of the seventh annual report of the honorary consulting biologist, in which Mr. W. E. Collinge, after referring to the spell of wet in 1912 as having been favourable to animal pests and inimical to game-birds, mentions some of the most serious cases of damage by insects and other pests which occurred during the year, with the best remedial measures for such infestations.

IN the October number of *The American Naturalist* Prof. W. S. Anderson insists on the importance of the study of the inheritance of coat-colour in horses. "If," he remarks, "there is a law governing the transmission of colour, may we not infer that a law of somewhat like nature will govern the transmission of the more essential qualities of the horse? If it can be proved that colours are unit characters and their inheritance obeys the Mendelian law of dominants and recessives, I believe one very important step will have been taken to solve the whole problem of breeding horses." Very noteworthy is the fact that when chestnut horses are mated with one another the progeny all seem to inherit the (recessive) colour of their parents, the recorded exceptions of one per cent. being probably due to error.

IN the current number of *The Journal of Agricultural Science* (vol. v., part 4) Messrs. W. A. Davis and A. J. Daish contribute a study of the methods of estimation of carbohydrates, especially in plant extracts. Certain sources of error encountered in the estimation of sugars in plant extracts, particularly of cane-sugar and maltose, are dealt with. A new method of estimating maltose, based on the use of pure cultures of maltase-free yeasts, such as *Saccharomyces marxianus* and *S. exiguus* has been devised. This is the only one available in such cases, as the ordinary method, using dilute hydrochloric acid for the hydrolysis of maltose, leads to destruction of much lævulose and to quite erroneous results. A scheme for the analysis of the complex mixtures of sugars, namely pentoses, dextrose, lævulose, cane-sugar, and maltose, occurring in plant extracts is appended. Mr. Davis also describes, in a separate paper, a simple laboratory apparatus for the continuous evaporation *in vacuo* of large volumes of liquids, such as plant extracts, which under the ordinary conditions froth badly and thus present difficulties.

The Journal of Economic Biology for September contains a valuable "General Survey of the Insect Fauna of the Soil," by Mr. A. E. Cameron, of the department of agricultural zoology in the University of Manchester. The researches described have been carried out in the grounds at Fallowfield attached to the economic laboratory, and from this small area a wonderful amount of interesting information has been obtained. The author gives a catalogue of more than 150 species of Apterygota, Coleoptera, Lepidoptera, Diptera, and Hymenoptera found in the soil at least during some stage of their life-history, together with the depth and nature of their habitat and observations on their food. He also discusses the effect exerted by these terrestrial insects on the soil as regards moisture, temperature, and ventilation—all factors of great cultural importance. It is regrettable that this excellent paper is disfigured by an abnormal number of misprints, and we do not understand why the explanations of some of the well-drawn figures of larvæ are given in German rather than in English.

THE October number of *The Journal of Genetics* (vol. iii., No. 2) contains papers of very varied interest. Prof. Punnett and Miss Pellew deal with gametic reduplication ("coupling") in sweet-peas and peas. Prof. Punnett gives evidence that when two dominant factors are introduced into a double heterozygote from different parents, the ratio of "repulsion" is the same as that of the coupling found when they are introduced from the same parent. When three factors are concerned together, the ratios between any two of them are modified, and he shows that the modification appears to agree with Trow's hypothesis of secondary reduplication. Mr. J. C. F. Fryer gives a preliminary account of Mendelian segregation in a sexually dimorphic Phasmid, in which the females differ in two pairs of characters; perhaps his most interesting observation is that typical Mendelian segregation may occur in parthenogenetic reproduction. Mr. E. N. Wentworth shows that strains of Drosophila (Diptera) of very different fecundity may arise by inbreeding from one pair, and suggests that loss of fecundity on inbreeding may be due simply to the segregation of such strains of low fertility. Pure strains of high fertility showed no loss in eight generations of inbreeding. Mr. C. Todd gives a lucid account of hæmolytic tests, showing that not only phylogenetic relationship may be tested in this way, but also that each individual has characteristic blood-corpuscles, the fate of which, when injected into another individual, can be followed. He gives indications of the hereditary transmission of these individual blood-characters. Mr. C. J. Bond shows that after apparently complete removal of the testicular tissue of birds, a full-sized testis may be regenerated, and suggests that the proportions of gametes bearing different hereditary characters may differ in the regenerated testis from those existing in the normal testis.

AN important investigation, entitled "Cloud and Sunshine of the Mediterranean Region," by Mr. J. Friedemann forms Part 2, vol. xxxv., of *Archiv der Deutschen Seewarte*. The area dealt with extends to many parts beyond the Mediterranean district, and includes data from no fewer than twelve meteorological services. Many of the observations have been already published in widely scattered volumes; one of the merits of the present discussion is the bringing together of the separate data. The monthly, seasonal, and yearly distributions of the elements in question are shown in great detail; to obtain a satisfactory idea of these it will be necessary to refer to the original paper, which is accompanied by numerous tables and several coloured charts. One of the diagrams, however, consists of isopleths showing the variation of the yearly range of the amount of cloud on both sides of a line from Little St. Bernard to Beni Suef (Egypt). From this may be seen, *inter alia,* the peculiarities of the range at alpine stations, the rather cloudy condition of the Apennines, the decrease to the south-east, the small amount on the west of Greece, especially in summer, and the great differences in the Ægean Sea. A large part of this laborious work was prepared by the late Mr. F. Zillmann at the instigation of Prof. Partsch.

THE October number of the Journal of the Institution of Electrical Engineers is devoted almost exclusively to the subject of electric traction. At the joint meeting of the Institution and the Société Internationale des Electriciens, held in Paris in May, the question of the electrification of existing railways was widely discussed, and it seems evident that the problem is no longer a technical one but is now purely financial. The difficulties of construction and maintenance have been overcome, and direct-current and single and three-phase systems are all now in operation. While each of these three systems claims to be more economical than steam traction, there does not appear to be any certainty as to which of them is best. On the whole the papers read and the discussion which followed them tended to favour the continuous system with much higher voltages—*e.g.* 2400—than are usual at present, but it was evidently felt even by the advocates of such a system that there were circumstances under which the other two systems might be used with advantage.

AT a meeting of the Alchemical Society held on November 14, a paper was read by Mme. Isabelle de Steiger, entitled "The Hermetic Mystery," the chair being occupied by the acting president, Mr. H. Stanley Redgrove. Mme. Isabelle de Steiger's interpretation of the theories and aims of the ancient and medieval alchemists differs radically from that accepted by many students of the history of philosophy and science, her views in the main agreeing with those expressed in that well-known but exceedingly scarce work, "A Suggestive Enquiry into the Hermetic Mystery and Alchemy" According to the lecturer, the doctrines underlaying alchemy were the primitive doctrines at the heart of every ancient religion. Alchemy, she maintained, was not concerned with metals but with man, whom the alchemists endeavoured spiritually to perfect through a process analogous to that said to have been discovered by Mesmer. The alchemists, she said, formed a sort of free secret order, and their writings were crypto grammatic, being intended to be understood by one another only. They were couched in the language of chemistry to mislead the ignorant, this being necessary on account of the danger attendant upon any misuse of the processes with which they dealt. The full text of the lecture will be published in the November number of the society's Journal.

AN article by Mr. W. A. Caspari, entitled "British Chemistry and British Manufactures," is published in the November issue of *The British Review.* Mr. Caspari insists again upon the importance of the manufacturers of this country learning to appreciate the value to their industries of the services of highly qualified men of science. In the application of chemistry to industrial objects, Great Britain was the pioneer and undisputed leader during the earlier periods of the industrial revival. At present Germany stands easily supreme in all purely chemical manufactures, except possibly metallurgy and "heavy chemicals"; and the potency of German competition resides in clear-thinking German appreciation of applied science. Mr. Caspari asks: What is wrong? Too many of our manufacturers prefer to run their works with clerks, engineers, and "practical" men; in Germany, the chemical element in the *personnel* of the factory is strong, not only numerically, but also as regards rank. The British manufacturer's mind seldom soars beyond the conception that a chemist is a person who analyses things. He too often fails to realise that the scientific man, far from being merely a useful background accessory like the works' plumber, holds the key to the whole of his manufacture. Mr. Caspari makes some wise suggestions for the more suitable training of chemists in universities and colleges, and maintains that once the suitable type of chemist is produced and planted in our factories, our industrial system will evolve almost imperceptibly in the right direction, and our captains of industry with it.

MESSRS. H. F. ANGUS AND CO., 83 Wigmore Street, London, W., have issued a catalogue of second-hand microscopes, objectives, and accessories, which they have for sale or hire. In addition to second-hand instruments, Messrs. Angus have in stock some forty or more different patterns in microscopes and an equal variety in accessory apparatus, which include specimens of English, American, Austrian, German, Italian, and Swedish manufacture. It should prove a great convenience to purchasers to be able easily to compare instruments of varied character and range.

THE following books are announced, as in the press or in preparation, by the Cambridge University Press:—In the "Cambridge Psychological Library": "Psychology," Prof. J. Ward; "The Nervous System," Prof. C. S. Sherrington, F.R.S.; "The Structure of the Nervous System and the Sense Organs," Prof. G. Elliot Smith, F.R.S.; "Prolegomena to Psychology," Prof G. Dawes Hicks; "Psychology in Relation to Theory of Knowledge," Prof. G. F. Stout; "Mental Measurement," Dr. W. Brown; "The Psychology of Mental Differences,"

C. Burt; "Collective Psychology," W. McDougall, F.R.S.; "The Psychology of Personality and Suggestion," T. W. Mitchell; "The Psychology of Dreams," T. H. Pear. In the "Cambridge Technical Series":—"Automobile Engineering," A. Graham Clark; "Electro-Technical Measurements," A. E. Moore; "Applied Mechanics," E. S. Andrews; "Alternating Currents," W. H. N. James; "Chemistry and Technology of Oils and Fats," F. E. Weston; "Paper, its Uses and Testing," S. Leicester; "Mining Geology," Prof. G. Knox; "Textile Calculations—Materials, Yarns, and Fabrics," A. M. Bell; "Domestic Science," C. W. Hale; "Business Methods," Thomas Hart, jun.; "Electrical Engineering," T. C. Baillie; "Applied Mechanics and Heat Engines," F. Boulden; "Elements of Applied Optics," W. R. Bower; "Physics for Engineers," J. F. Yorke; "English Building Construction," C. F. Innocent; "Sculpture in Relation to Architecture," T. P. Bennett; "Electric Installations," C. W. Hill; "Accounting," J. B. Wardaugh; "The Theory and Practice of Commerce," J. C. Stephenson. In the "Cambridge Health Series": "The Bacteriological Analysis of Water, Sewage and Foods," Dr. W. G. Savage; "Isolation Hospitals," Dr. H. F. Parsons. In the "Provincial Geographies of India": "Bengal and Orissa," L. S. S. O'Malley; "The Punjab, N.W. Frontier Province, and Kashmir," Sir J. McC. Douie.

OUR ASTRONOMICAL COLUMN.

COMET NEWS.—Miss Anna R. Kidder, of the Berkeley Astronomical Observatory, communicates to the Lick Observatory Bulletin, No. 245, the elliptic elements and ephemeris of comet 1913*e* (Zinner). The elements she has computed correspond so closely to those of comet 1900 III. (Giacobini) that she concludes that both comets are identical. The two sets of elements are as follows:—

	Comet 1900 III. (Giacobini)		Comet 1913*e* (Zinner)	
T =	1900, Nov. 28·17		1913, Nov. 2·1047 G.M.T.	
ω =	171° 29′		171° 29·1′	
☊ =	196 32	1900·0	195 27·3	1913·0
i =	29 52		31 01·1	
q =	0·9342		0·97787	
e =	0·74168		0·72968	

The average period derived from the dates of perihelion passage in 1900 and 1913 is 6·464 years.

Two publications, namely the Lick Observatory Bulletin, No. 239, and the Lowell Observatory Bulletin, No. 57, contain accounts of photographs secured at the respective observatories. In the former, Dr. C. C. Kiess describes the observations made on comet 1911*c* (Brooks) and illustrates his descriptions with ten excellent reproductions. In the latter communication Mr. C. O. Lampland describes fully the photographs secured at the Lowell Observatory of the fine comet 1910*a*. A large series of most striking photographs is also reproduced. In the addenda to the paper he discusses the heliographic positions of this comet, and adds some remarks in connection with the heliographic latitudes of Donati's comet (1858 VI.), and Chéseaux's comet (1744 I.) when near perihelion.

MAGNIFYING POWERS USED BY DOUBLE-STAR OBSERVERS.—Mr. T. Lewis, writing in *The Observatory* for November, brings together some very interesting facts relating to the magnifying powers used by double-star observers. The object of the inquiry was to answer the question, "What is the best magnifying power of a telescope in actual practice?" and, in the hope of arriving at some definite result, he made counts of thousands of observations all over the world by various observers. The result of the investigation was to produce a formula—

$$\text{Magnifying power} = 140\sqrt{A},$$

where A is the diameter of the aperture, in inches, and this formula gives an excellent representation of the values derived from the discussion of the actual observational data. Thus the formula, as Mr. Lewis says, "may safely be taken as representing the consensus of opinion among experienced observers in their choice of the best magnification for a given telescope; and it may, therefore, be useful as a guide to others in selecting the eyepieces which will best suit their particular telescope."

STELLAR CLASSIFICATION.—At the Lick Observatory much work has recently been accomplished in the classification of stellar spectra. Bulletins 237 and 243 contain two researches in this subject, both of which have been carried through by candidates for the degree of doctor of philosophy in the University of California, a fact which indicates the increased attention now being devoted to this section of astrophysics. The first of these papers deals with "Class B Stars whose Spectra Contain Brignt Hydrogen Lines," and is the work of Mr. Paul W. Merrill.

By using plates stained with Wallace's three-dye stain the spectrograms included Hα. Five slit-prism spectrographs giving dispersions ranging from 8·7 A per mm. at Hγ, and one grating spectrograph giving in the second order at Hα (with that line central) 10·9 A per mm. were employed, attached to the 36-in. refractor.

The survey included nearly all the stars of the above description north of $-40°$, and some related stars; also some stars included either because on three-prism spectrograms Hβ was peculiar, or the lines were weak and diffuse in order to see whether Hα might be bright. The bright components of the Hβ line of γ Cassiopeiæ and b_2 Cygni were tested, with negative results, for polarisation. The author confirms the presence of the chromospheric lines $\lambda\lambda$4924 and 5018 in these stars, first pointed out by Sir Norman Lockyer and Mr. Baxandall in 1905. With regard to the doubling of the bright hydrogen lines, complex self-reversal is suggested as the explanation most in accord with the facts. Finally, Mr. Merrill divides these stars into four groups, of which the types are γ Cassiopeiæ, b^2 Cygni, Electra, and ϕ Persei. The groups contain fourteen, nineteen, two, and three stars respectively, whilst six stars remain unclassified. The variability and distribution of these stars also receives attention.

Bulletin 243 contains a photographic study of the visual region of the spectra of the brighter Class A stars, by Miss E. Phœbe Waterman. The line of greatest wave-length measured was λ6517, of unknown origin. Miss Cannon's proposal to rearrange the classification of these stars is supported; the stars now classified as A would thus be divided between classes A0 to A2. In the summary it is stated that the metal lines present are the enhanced or spark lines of the elements represented. They coincide throughout in wave-length and intensity with the stronger lines of the solar chromosphere. The peculiarity of the spectrum of α Cygni is found to consist in the great intensity of some of the iron lines, and in the narrow and well-defined character of all the lines rather than in the presence of lines foreign to stars of Class A. Miss Waterman finds that some stars perhaps show bright borders to the absorption lines.